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Food Handlers' Attitude towards Safe Food Handling in School Canteens

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Abstract

This study measure food handlers' attitude on food safety as well as their belief and their perceive barrier toward safe food handling. Three hundred and sixty three respondents were proportionate selected randomly from four urban areas representing four zones in Peninsular Malaysia namely Alor Setar (Kedah), Kuantan (Pahang), Shah Alam (Selangor) and Melaka by using cluster sampling. This study demonstrated that food handlers' attitude have positive and significant relationships with safe food handling. It is essential for food handling certification program, which reveal behavioural change for a better quality training.

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Keywords: Attitude; behavior change; food handlers; food safety training

1. Introduction

Food service industry in Malaysia is a sector targeting on local population of about 26 million persons with a short-term population of tourist and business visitors of almost 22 million persons annually (Tourism Malaysia, 2008). Food service industry faces rigid competitions, challenges as consumers demand higher quality food, government need to guarantee safe consumption of food, business owners and/or shareholders focusing on increasing technology efficiency to increase profit (Spears, 2000; USDA, 2009) that may imitate in conflicting of interest. Foodborne diseases are extensive both in developed and

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more so in developing countries. It is of good concern that World Health Organization (WHO, 2007) reported in the year 2005 that 1.8 million people died from diarrhoea one of vary foodborne diseases. For this reason, foodborne diseases have captured public awareness worldwide in recent years. Centre Disease Control and Prevention (CDC, 2000) identified five risk factors of food handling that add to foodborne illnesses which include improper cooking procedure, temperature abuse during storage, lack of hygiene and sanitation by food handlers, cross contamination between raw and fresh ready to-eat foods.

Students are captive customer who is usually incompetent to purchase food from external sources during six hours they are at school. It is important for schools to realize their shared responsibility to provide nutritious and safe food to their students. School meals are significant because they are one of the most perceptible instruments for policy intervention in children's diet to hold up development of healthy eating patterns (Moy, Gan and Siti Zaleha, 2006; Yabanci and Sanlier, 2007). The Ministry of Health Malaysia (MOH, 2007) reported in 2006 that the incident rate for food poisoning was 26.04 per 100,000 people. However, WHO (2008) reported in 2007 there was raise of incidence rates for food poisoning at 52.6 per 100,000 people which is one of top five diseases in Malaysia. In line with such report, there was in fact an increase in number of episodes of foodborne outbreak reported by various states in Malaysia commonly outbreaks occurring in schools (Zain and Naing, 2002; WHO, 2008;Sharif and Al-Malki, 2010). Besides, an epidemiology study found out that since 1997, foodborne outbreaks increased 66.5% among school age group in Malaysia (Meftahuddin, 2002; Naing, Zain, Hamzah, Mat, Abdullah and Bakar, 2007). In Malaysia, food poisoning recorded the highest incidence rate of communicable disease in food and water borne disease category (44.18 per 100,000 populations) as presented in Table 1 (MOH, 2011). Previous record showed that 48% of the total food poisoning cases in year 2007 actually took place in schools with Selangor, Perlis, Kedah, Perak, Sabah and Kelantan as the six states with the most regularly reported cases (Utusan, 2008). On a smaller scope in 2008, Pahang traced more than 71% of their overall food poisoning cases in school canteen (Utusan, 2008). Further report revealed more than 88% of food poisoning cases in Johor apparently involved the students (Utusan, 2009).

These numbers established that schoolchildren have been the foremost victim in many food poisoning cases mainly in Malaysia. Children with weakened immune systems are more at risk of getting ill from food poisoning than those who are in good health. As one of many other types of foodservice operations, school canteens are most frequently cited locations for outbreaks of foodborne disease (Seaman, 2010; Sanlier and Konaklioglu, 2012). Children are most vulnerable to foodborne diseases because their immune systems are not fully developed (McSwane, Rue and Linton, 2003). The purpose of this study is to investigate the variation in attitude that influence food handlers' behavior towards safe food handling and to examine the influence of perceived barriers among food handlers behavior toward safe food handling.

In the light of pressing concern pertaining to safe food consumption amongst young children, it is vital to examine the outcome on attitude of food handlers in school canteens towards safe food handling.

Table 1. Incidence rate and mortality rate of communicable disease per 100,000 populations in Malaysia

Food and Water Borne Diseases		
Communicable Diseases	Incidence Rate	Mortality Rate
Cholera	1.56	0.02
Dysentery	0.37	0
Food Poisoning	44.18	0
Typhoid	0.74	0
Hepatitis A	0.14	0

Source: Ministry of Health Malaysia (2011)

2. Literature review

2.1. Attitude on food safety

Food safety is responsibility of every person who involved in food service operation to handle food. According to Nieto-Montenegro, Brown and Labarde (2008), general food handling mistakes besides serving contaminated raw food also includes inadequate cooking, heating, or reheating of food consumption of food from unsafe sources, cooling food inappropriately and allowing too much of a time lapse. Those errors might lead to food poisoning. Many studies identify the need for training and education of food handlers in public hygiene measures on microbiological food hazards, temperature ranges of refrigerators, cross contamination and personal hygiene (Ogden, 2003; Bas et. al., 2004; Worsfold and Griffith, 2010). However, in some preceding studies show no differences between staff who attended educational course with those who did not (Almanza, Namkung, Ismail and Nelson, 2007; Afifi and Abshelaibi, 2012). This statement is supporting by several studies (Compos, Cardoha, Pinheiro, Ferreira, Azevedo and Stamford, 2009; Thobaben, 2010) and it shows that although training may increase the knowledge of food safety but it might not always turn out positive change in food handlers' attitude. Attitude is a measure of degree to which a person has favourable or unfavourable evaluation towards behaviour (Azjen, 1980). Such as person thinks that preparing and handling food hygiene is important and necessary, they are likely intend to engage the behaviour. Vladimirov (2011) point outs the correlation of positive behaviour, attitudes and continued education of food handlers towards the maintenance of safe food handling practices. Contradict with Bas et. al. (2004) in their study establish that attitude scores of the food handlers toward foodborne diseases prevention and control was poor as well as hygiene practices scores were even low.

Social cognitive models from the area of health psychology frequently posited as important implement in improving both forecast and intervention research in safe food handling (Rennie, 1995). One such model is Health Belief Model (HBM) by Rosenstock in year 1975; which considers barriers and benefits of engaging in safe food handlings as well, as how severe food poisoning is seen to be and the degree of susceptibility to the illness. HBM consists of five variables but the researcher is focusing on two variables related to study that perceived susceptibility and barrier of taking actions. Perceived susceptibility is belief on perceived chances that one can influence by specific condition or disease (Azjen, 1980; Hilton, 2002). For example, it would be presume that more susceptible one feels to foodborne illnesses, the more critical one would foresee the outcomes. As for perceived barriers are indicative of the challenges one expects when attempting to engage in health behaviour. For example food handlers believe that washing hands would avoid foodborne illness, but they identify time constraints and lack of facilities is barrier to comply with this behaviour.

3. Methods

Three hundred and sixty three respondents were proportionate selected randomly from four urban areas representing four zones in Peninsular Malaysia namely Alor Setar (Kedah), Kuantan (Pahang), Shah Alam (Selangor) and Melaka by using cluster sampling, resulting in response rate of 72.6%. The respondents were among food handlers in primary school canteens. This study employed self-administered questionnaire for data collection. Respondents could attend at their own convenient time without pressure (Sekaran, 2010). The structured questionnaire is to measure all construct involved. The development of the questionnaire involves three sections. The first section is to measure attitude towards behaviours with 16 attributes developed based on past literature on perceived susceptibility and perceived barrier, and the attributes modified to suit the context of the study. The respondents were asked to rate on

a seven-point Likert scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The second section is to measure safe food handling with 15 attributes. For this section, the Likert scale ranging from 1 (never) to 7 (always). Finally, the third section is asking on respondents' demographic profile. The data collection period took approximately three months for completion. Data gathered were analyzed by using Descriptive statistical (mean, standard deviation and frequencies) for all variables which measure score of each item in every section that measured level of agreement of the respondents. Bivariate correlation coefficient analysis used to determine the correlation between food handlers' attitude on food safety and safe food handling.

4. Results and discussion

4.1. Profile of respondents

According to table 2, there were 76.4% female and 23.6% male respondents. The majority of the respondents were the age group of 45 to 54 years old (26.1%). Approximately, 77.2% of the food handlers are married and majority of them are Malaysian with 92.3%. Result also showed that 68.7% education level are among secondary level with 37.4% working experience more than 8 years as food handlers. Finally, 72.3% of the food handlers had their formal training on food handling certified by the Ministry of Health, Malaysia with 93.7% had their typhoid injection. It shows that 27.7% of food handlers did not comply on food handling certification according to the Food Hygiene Regulation 2009.

Table 2. Demographic characteristic of the respondents

Demographic characteristic	Number of respondents	Percentage (%)
Gender (n=363)		
Male	86	23.6
Female	278	76.4
Age		
16 to 24	46	12.9
25 to 34	79	21.7
35 to 44	90	24.7
45 to 54	95	26.1
55 to 64	46	12.6
Over 65	7	1.9
Marital Status		
Single	73	20.1
Married	281	77.2
Others	10	2.7
Nationality		
Malaysian	335	92.3
Others	28	7.7
Education level		
None	11	3.0
Primary school	62	20.1
Secondary school	250	68.7
College or University	41	11.3
Food Handling Certification		
Yes	262	72.3
No	101	27.7

Typhoid Injection		
Yes	340	93.7
No	23	6.3
Working Experience		
6 months to 1 year	68	19.0
2 to 3 years	51	14.0
4 to 5 years	49	13.5
6 to 7 years	59	16.2
More than 8 years	136	37.4

4.2. Attitude on food safety

Respondents were asked to select their response from a Likert scale of 1 to 7, where 1 = 'strongly disagree', 2 = 'disagree', 3 = 'slightly disagree', 4 = 'neutral' 5 = 'slightly agree', 6 = 'agree', 7 = 'strongly agree'. Referring to table 3, majority of the food handlers agree that adhere to school canteen management guideline will reduce food poisoning occurrence (M=5.99, S.D=1.204). However, food handlers slightly agreed with controlling temperature is one of an effective way to reduce food poisoning. Therefore, food handlers agree with school cleanliness monitoring system, which provides a good feedback for improvement in food hygiene practices. Finally, majority of the food handlers agree that they should have a certified food safety training to prevent from food poisoning occurring.

Second statement is discussing on food handlers perception barrier to carry out food safety behaviour. Majority of food handlers agree that they were facing difficulties to carry out food safety behaviour if kitchen equipment are located at inconvenient place for food production and no formal food guidelines for reference if there is any mishandling occurred. In addition to this, food handlers slightly agree that small working space is barrier for them to carry out food safety behaviour. Besides, food handlers agree that without sufficient dry and wet storage influence their food safety practices. As such, food handlers agree that lack of supervisor commitment and inadequate training pertaining to safe food handling will lead to food poisoning occurrence. This explains the need for relevant training, as reported above only 77% was given such training. Food handlers moderately agree that they face barriers to carry out food safety behavior especially with unavailability of food handling guideline, kitchen equipment in an inconvenient location and small working space to prepare food. This analysis revealed food handlers beliefs the importance of safe food handling and there are barriers to carry out food safety behaviour, but the food handlers agreed that they must have positive attitude on handling safe food (Mitchell, Fraser and Bearou, 2007).

Table 3. Mean attitude on food safety of sampled food handlers

Statement	Mean (M)	Standard Deviation (S.D)
Beliefs		
Adherence to School Canteen Management Guidelines will reduce chances of food poisoning occurrence	5.99	1.204
Temperature Controls are an effective method of reducing the number of cases of food poisoning	5.32	1.398
Monitor temperature of raw and cooked food are vital	5.70	1.311
School cleanliness monitoring system provides good feedback for improvement	5.80	1.212

All food handlers should have a food safety training qualification	5.83	1.267
Food Act 1983 enhances compliance to food hygiene practices	5.97	1.110
Perceived Belief		
It is difficult for me to carry out food safety behaviour due to...		
Small working space to prepare food	4.45	1.927
Unavailability of food handling guideline	4.56	1.900
Kitchen equipment in an inconvenient located in	4.48	1.981
Insufficient kitchen equipment	4.26	1.981
Insufficient dry storage	4.02	2.045
Insufficient wet storage	4.17	2.026
Inadequate training pertaining to safe food handling	4.29	1.877
Lack of team work	4.14	2.002
Lack of supervisor commitment to safe food handling	4.23	1.921

4.3. Relationship between attitude and safe food handling

The relationship between IV and DV are weak but positively correlated. The result of the correlation coefficient between compliance and safe food handling is r = .065, p>.01, whilst perceived barrier and safe food handling is r = .084, p>0.01. From this outcome, food handlers have positive attitude towards compliance to safe food handling but are not provided with school canteen guidelines to guide safe hygiene practices. Perceived barrier are not considered a hindrance to safe food handling but again relevant guidelines are not made available to ensure good kitchen practice. Sharif and Al-Malki (2010) reported that beliefs on food safety and perceived barrier are important predictors to ensure food handlers comply with safe food handling. But this study found weak correlation perhaps because this study is conducted in cities, where food handlers are more exposed. However the biggest hindrance to safe food handling are the unavailability of relevant printed material that provide guidance to canteen food handling hygiene and good kitchen practices (Both these items scored mean score of 6.00 (agreed) for Guidance to canteen food handling and 5.00 (moderately agree) for guide to food handling hygiene.

Table 4. Correlation between attitude and safe food handling

		Food Handling	Compliance	Perceived Barrier
Food Handling	Pearson Correlation	1	.065	.084
	Sig. (2-tailed)		.215	.108
	N	363		
Compliance	Pearson Correlation	.065	1	-.064
	Sig. (2-tailed)	.215		.223
	N	363		
Perceived Barrier	Pearson Correlation	.084	-.064	1
	Sig. (2-tailed)	.108	.223	
	N	363		

5. Conclusion

Attitude toward compliance is positively correlated to safe food handling especially in terms of adherence to school canteen management guideline and Food Act 1983 regulation in enhancing compliance with food handling. Findings in this study reported that adherence to school canteen rules and government regulations play important roles in influencing food handlers' attitude towards safe food handling. It was

so found that Perceived barrier generally do not hinder safe food handling. However, small working space, inconvenient location for kitchen equipment and unavailability of food handling guideline toward achieving safe food handling are individual items in the questionnaire that scored high, showing respondents' agreement to these as barriers in safe food handling. In conclusion, proper printed guidelines on canteen food handling and a separate guideline on kitchen good practice may have an impact on safe food handling behavior. This finding is hoped contribute to Malaysia's effort to avoid or reduce food poisoning occurrence amongst schoolchildren in the future.

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